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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/642,881	08/18/2003	Mark Bader	EMP 0120 PUS2	3319

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EXAMINER	
SAYOC, EMMANUEL	

ART UNIT	PAPER NUMBER
3746	

DATE MAILED: 07/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/642,881	BADER ET AL.	
	Examiner	Art Unit	
	Emmanuel Sayoc	3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 May 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) *10-15* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *8/18/03, 11/15/04* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5/23/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the amendments of 5/23/2005. In making the below rejections and/or objections the examiner has considered and addressed each of the applicants arguments. Claims 1-15 are pending, and claims 1-9 are under current consideration.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moriya et al. (U.S. 5,401,146), and in view of Hurley (GB 2,346,266).

With respect to claims 1, 7, and 8, in Figure 1, Moriya et al. discloses a fluid pump, in this particular case for a compressor. The fluid pump consists of a motor housing assembly having an inlet housing (2), a stator housing (9), an outlet housing (5), a rotor (27), and a rotor shaft (16) supported by front and rear bearings (30, 33). The stator housing assembly (9) includes a substantially cylindrical metal case (outer housing) and an encapsulated stator assembly (23, 27). The device further includes an impeller (15) rotatably positioned in the inlet housing (2) and having an impeller axis. A

rotor assembly (28) is rotatably located inside a rotor cavity (formed by 29) and is connected to the impeller (15) for rotating the impeller (15) for pumping liquid from the inlet housing (2) to the outlet housing (5).

The Moriya et al. device differs from the claimed invention in that there is no explicit teaching that the stator is encapsulated with a polymeric material.

Encapsulation is intended to provide protection, electrical insulation, and thermal dissipation enhancement. The Moriya et al. device recognizes the need for protectively covering the stator assembly from the fluid flow, as well as the need to dissipate heat from the stator assembly. As mentioned above, stator encapsulation was not a new concept at the time the invention was made. Hurley provides an example of an electrical motor device that features the encapsulation of the entire stator. The encapsulation material, a glass polyester dough molding compound, qualifies as a polymeric material as claimed in claims 1, 11, 29, and 40. This encapsulation clearly provides protection from the flow of fluid or any external agents. In addition, polymeric material encapsulation of electric conductors particularly within stator assemblies was known in the art at the time the invention was made. Therefore in Moriya et al. in view of Hurley, it would have been obvious to one having normal skill in the art at the time the invention was made to modify the enclosed stator assembly of Moriya et al. to a polymeric encapsulated assembly, as taught by Hurley, in order to achieve the protective covering, electrical insulation, and thermal conductive properties associated with a polymeric encapsulation. Such a modification would insure that the stator windings would be properly secured and insulated from one another and the external

fluid. Thermal conductivity and electrical insulation are properties of polymeric materials that are advantageous in such fluid pumps. The flow of fluid through the pump's inner cavity provides cooling for the encapsulated stator assembly, thus improving pump operation and efficiency.

With respect to claim 2, the inlet housing (2) and outlet housing (5) are fastened together to secure the stator housing assembly there between.

With respect to claims 3 and 6, the metal case includes liquid flow passages (45) formed therein by ribs (24a, Figure 4), which constitute diffuser vanes, and inner (23) and outer walls (9) of the metal case (9), thereby completely defining the liquid flow passages.

With respect to claim 4, the polymeric capsule member comprises a thermally conductive, electrically insulative material.

With respect to claim 5, the stator housing (9) assembly further includes a front cover (26) and a rear cover (25) plugging opposing ends of the rotor cavity.

With respect to claim 6, the fluid pump further comprising inlet diffuser vanes (13) formed on the front cover (25).

With respect to claim 9, the fluid pump contains a bearing seat (35) for locating the rear bearing (33).

4. Claims 1-5, and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harlamoff (U.S. 2,520,880), and in view of Hurley (GB 2,346,266).

With respect to claims 1, 7, and 8, in Figure 1, Harlamoff discloses a fluid pump, in this particular case for a compressor. The fluid pump consists of a motor housing assembly having an inlet housing (2), a stator housing (1), and an outlet housing (3). The stator housing assembly (1) includes a substantially cylindrical metal case (outer housing) and an encapsulated stator assembly (4). The device further includes an impeller (11) rotatably positioned in the inlet housing (2) and having an impeller axis. A rotor assembly (shown not enumerated), with a rotor (shown), and rotor shaft (10), supported by front and rear bearings (7, 9), is rotatably located inside a rotor cavity (28 and inner wall shown in Figure 3) and is connected to the impeller (11) for rotating the impeller (11) for pumping liquid from the inlet housing (2) to the outlet housing (3).

The Harlamoff device differs from the claimed invention in that there is no explicit teaching that the stator is encapsulated with a polymeric material.

Encapsulation is intended to provide protection, electrical insulation, and thermal dissipation enhancement. The Harlamoff device recognizes the need for protectively covering the stator assembly from the fluid flow, as well as the need to dissipate heat from the stator assembly. As mentioned above, stator encapsulation was not a new concept at the time the invention was made. Hurley provides an example of an electrical motor device that features the encapsulation of the entire stator. The encapsulation material, a glass polyester dough molding compound, qualifies as a polymeric material as claimed in claims 1, 11, 29, and 40. This encapsulation inherently provides protection from the flow of fluid or any external agents. In addition, polymeric material encapsulation of electric conductors particularly within stator assemblies was

known in the art at the time the invention was made. Therefore in Harlamoff in view of Hurley, it would have been obvious to one having normal skill in the art at the time the invention was made to modify the enclosed stator assembly of Harlamoff to a polymeric encapsulated assembly, as taught by Hurley, in order to achieve the protective covering, electrical insulation, and thermal conductive properties associated with a polymeric encapsulation. Such a modification would insure that the stator windings would be properly secured and insulated from one another and the external fluid. Thermal conductivity and electrical insulation are properties of polymeric materials that are advantageous in such fluid pumps. The flow of fluid through the pump's inner cavity provides cooling for the encapsulated stator assembly, thus improving pump operation and efficiency.

With respect to claim 2, the inlet housing (2) and outlet housing (3) are fastened together to secure the stator housing assembly (1) there between.

With respect to claim 3 and 6, Harlamoff in Figure 3, teaches that it was well known in the art at the time the invention was made to incorporate fluid passages (24, 25, 26, and 27) within a stator housing to assist in cooling the pump and pump housing (see column 3 lines 27). The passages are completely defined by an inner wall (28), an outer wall (1), and a plurality of radial walls (shown not enumerated) constituting diffuser vanes.

With respect to claim 4, the polymeric capsule member comprises a thermally conductive, electrically insulative material.

With respect to claim 5, the stator housing (1) assembly further includes a front cover (5, 8) and a rear cover (6) plugging opposing ends of the rotor cavity.

With respect to claim 9, the fluid pump contains a bearing seat (shown) for locating the rear bearing (9).

Response to Arguments

5. Applicant's arguments filed 5/23/2005 with respect to claims 1-9 have been fully considered but they are not persuasive.

First the applicant argues that there is no teaching, suggestion or motivation to combine Hurley with Moriya et al., or Hurley with Harlamoff. In the Hurley abstract is clear that Hurley encapsulates his stator to provide electrical insulation. This alone is sufficient motivation to apply the encapsulation to the Moriya et al. pump stator. Moriya et al. and Harlamoff can be used to pump a wide variety of fluid both gaseous and liquid. Electrical conduction with the stator and these fluids need to be eliminated. Furthermore Hurley, as stated above, teaches the same material of encapsulation claimed by the applicant. It is therefore evident that the encapsulation also provides thermal conductive properties. One of ordinary skill in the art would have indisputably recognized that it is detrimental for a pump stator or the fluid surrounding it to be exposed to stray electrical current, and that is it advantageous for the stator to be

cooled to prevent over heating. The encapsulation also provides heat dissipation through the pumped fluid.

Second the arguments filed on 5/23/2005 state that the Hurley device has features that are completely unrelated Moriya et al. and Harlamoff. The rejections do not suggest that the devices are similar. Although one reference is a pump and the other is a motor, arguing non-analogous art would be improper. The pump is driven by an electric motor and naturally one of ordinary skill in the art of pumping would look into the electric motor arts for relevant teachings. Moriya et al. and Harlamoff pays attention to the problem of cooling the motor. Motor cooling and electrical insulation are two problems relevant to Moriya et al. and Harlamoff, and are two problems, which are solved by Hurley. Modifying Moriya et al. and Harlamoff, to enhance electrical insulation and heat dissipation in their respective motor stators, by stator encapsulation as taught by Hurley, demonstrate motivations that are proper. Combination of the references is therefore proper.

Third, arguments filed on 5/23/2005 state that the prior art combinations do not teach a polymeric capsule member defining a rotor cavity. In the complete encapsulation of the stators of Moriya et al. and Harlamoff, as suggested by Hurley and in the rejections above, the encapsulation would in fact define a rotor cavity.

Finally, arguments directed against Hurley, Moriya et al., or Harlamoff, as single references alone, does not successfully overcome the rejections as suggested in combination. The rejection does not suggestion of modifying Hurley, and the only

teaching taken from Hurley is the encapsulation of the stator for thermal and electrical considerations relevant to fluid pumping.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references are cited to further show the state of the art with respect to collision detection and control systems for linear compressors/motors.

U.S. Pat. 3, 559, 539 to Nagy – teaches a pump related to the claimed invention.

U.S. Pat. 3, 863, 935 to Batch – teaches a pump related to the claimed invention.

U.S. Pat. 5, 639, 227 to Mills – teaches a pump related to the claimed invention.

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emmanuel Sayoc whose telephone number is (571) 272 4832. The examiner can normally be reached on M-F 8-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy S. Thorpe can be reached on (571) 272-4444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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